

WHAT IS CLAIMED IS:

1                   1.       1. A feed system for an aerosolizer, the feed system comprising:  
2                   a feed system housing having an ampoule region that is adapted to receive an  
3 ampoule that contains a liquid and that includes a bottom end and a top end, and a liquid  
4 receiving region that is adapted to receive liquid dispensed from the ampoule, wherein the  
5 liquid receiving region includes an overflow region that extends along side the ampoule  
6 region above the bottom end of the ampoule; and  
7                   an interface that is adapted to couple the liquid receiving region to an aerosol  
8 generator, whereby liquid from the liquid receiving region is permitted to flow to the aerosol  
9 generator for aerosolization.

1                   2.       A feed system as in claim 1, wherein the liquid receiving region  
2 includes a tapered bottom end with a drain opening to funnel liquid from the ampoule to the  
3 aerosol generator.

1                   3.       A feed system as in claim 2, wherein the interface is adapted to  
2 produce a seal between the bottom end of the liquid receiving region and the aerosol  
3 generator.

1                   4.       A feed system as in claim 2, wherein the feed system housing includes  
2 a top portion and a bottom portion having the tapered bottom end, wherein the top portion is  
3 attachable to the bottom portion, and wherein the ampoule region and the overflow region  
4 comprise two elongate channels extending through the top portion.

1                   5.       A feed system as in claim 4, further comprising an o-ring seal  
2 positioned between the top portion and the bottom portion.

1                   6.       A feed system as in claim 1, further comprising a lid coupled to the  
2 feed system housing that is adapted to secure the ampoule within the ampoule region.

1                   7.       A feed system as in claim 6, wherein the lid includes a slot that is  
2 adapted to receive a top tab that extends from the top end of the ampoule.

1                   8.       A feed system for an aerosolizer, the feed system comprising:

an ampoule containing a liquid, wherein the ampoule has a top end and a bottom end;  
a housing having an ampoule region into which the ampoule is held, and a liquid receiving region that is adapted to receive liquid dispensed from the ampoule;  
an interface that is adapted to couple the liquid receiving region to an aerosol generator, whereby liquid from the liquid receiving region is permitted to flow to the aerosol generator for aerosolization.

9. A feed system as in claim 8, wherein the liquid receiving region includes an overflow region that extends along side the ampoule region above the bottom end of the ampoule.

10. A feed system as in claim 8, wherein the liquid receiving region includes a tapered bottom end with a drain opening to funnel liquid from the ampoule to the aerosol generator.

11. A feed system as in claim 10, wherein the interface is adapted to produce a seal between the bottom end of the liquid receiving region and the aerosol generator.

12. A feed system as in claim 10, wherein the feed system housing includes a top portion and a bottom portion having the tapered bottom end, wherein the top portion is attachable to the bottom portion, and wherein the ampoule region and the overflow region comprise two elongate channels extending through the top portion.

13. A feed system as in claim 12, further comprising an o-ring seal positioned between the top portion and the bottom portion.

14. A feed system as in claim 8, further comprising a lid coupled to the housing to secure the ampoule within the ampoule region.

15. A feed system as in claim 14, wherein the ampoule includes a top tab extending from the top end, and wherein the lid includes a slot through which the top tab extends.

16. A feed system as in claim 15, wherein the top tab is removable to form a vent opening in the top end of the ampoule.

1                   17.     A feed system as in claim 8, wherein the ampoule includes a bottom  
2     tab extending from the bottom end, and wherein the bottom tab is removable to form a drain  
3     opening in the bottom end of the ampoule.

1                   18.     A feed system as in claim 12, wherein the ampoule includes a bottom  
2     tab extending from the bottom end, and wherein the bottom tab extends distally beyond the  
3     top portion of the housing, and wherein the bottom tab is removable prior to connection of  
4     top portion with bottom portion to form a drain opening in the ampoule.

1                   19.     An aerosolization device, comprising:  
2                   a device housing having an interior and an exit opening;  
3                   an aerosol generator disposed within the device housing to eject an aerosolized  
4     liquid through the exit opening;  
5                   a liquid feed system disposed within the device housing, the liquid feed  
6     system comprising a feed system housing having an ampoule region that is adapted to receive  
7     an ampoule that contains a liquid, a liquid receiving region that is adapted to receive liquid  
8     dispensed from the ampoule, and an interface that couples the liquid receiving region to the  
9     aerosol generator, whereby liquid from the liquid receiving region is permitted to flow to the  
10    aerosol generator for aerosolization.

1                   20.     A device as in claim 19, wherein the liquid receiving region includes  
2     an overflow region that extends along side the ampoule region above the bottom end of the  
3     ampoule.

1                   21.     A device as in claim 19, wherein the liquid receiving region includes a  
2     tapered bottom end with a drain opening to funnel liquid from the ampoule to the aerosol  
3     generator.

1                   22.     A device as in claim 21, wherein the interface includes a seal member  
2     to produce a seal between the bottom end of the liquid receiving region and the aerosol  
3     generator.

1                   23.     A device as in claim 19, wherein the aerosol generator includes a seal  
2     member to produce a seal between the aerosol generator and the interface. ☒

1           24.     A device as in claim 21, wherein the feed system housing includes a  
2 top portion and a bottom portion having the tapered bottom end, wherein the top portion is  
3 attachable to the bottom portion to permit the top portion to be removed from the device  
4 housing, and wherein the ampoule region and the overflow region comprise two elongate  
5 channels extending through the top portion.

1           25.     A device as in claim 24, further comprising an o-ring seal positioned  
2 between the top portion and the bottom portion.

1           26.     A device as in claim 19, further comprising a lid coupled to the feed  
2 system housing that is adapted to secure the ampoule within the ampoule region.

1           27.     A device as in claim 26, wherein the lid includes a slot that is adapted  
2 to receive a top tab that extends from the top end of the ampoule.

1           28.     A device as in claim 19, wherein the aerosol generator comprises a  
2 vibratable member having a plurality of apertures and a vibratable element to vibrate the  
3 vibratable member.

1           29.     An aerosolization system in kit form, comprising:  
2 an aerosolization device comprising a device housing having an exit opening,  
3 an aerosol generator held within the housing to provide an aerosolized liquid through the exit  
4 opening, and a liquid receiving portion of a liquid feed system; and  
5 a liquid feed system receiver unit having an ampoule containing a liquid to be  
6 aerosolized, wherein the receiver unit is insertable into the aerosolization device to couple  
7 with the liquid receiving portion.

1           30.     A kit as in claim 29, wherein the receiver unit includes an ampoule  
2 region having the ampoule and a liquid overflow region adjacent to the ampoule region for  
3 receiving overflow liquid from the liquid receiving portion.

1           31.     A kit as in claim 29, wherein the ampoule has a top end and a bottom  
2 end, a top tab extending from the top end that is removable to form a vent opening, and a  
3 bottom tab extending from the bottom end that is removable to form a drain opening.

1                   32.     A kit as in claim 31, wherein the receiver unit has a bottom end with an  
2 opening that is sized to permit the bottom tab to extend through the bottom end of the  
3 receiver unit.

1                   33.     A kit as in claim 31, wherein the receiver unit has a top end with an  
2 opening that is sized to permit the top tab to extend through the top end of the receiver unit.

1                   34.     A kit as in claim 29, further comprising an o-ring seal positioned  
2 between the receiver unit and the liquid receiving portion.

1                   35.     A kit as in claim 29, wherein the liquid receiving portion has a tapered  
2 bottom end that is operably coupled to the aerosol generator.

1                   36.     A kit as in claim 29, wherein the aerosol generator comprises a  
2 vibratable member having a plurality of apertures and a vibratable element to vibrate the  
3 vibratable member.

1                   37.     A method for aerosolizing a liquid, the method comprising:  
2                   inserting an ampoule containing a liquid into an aerosolization device having a  
3 liquid feed system, an aerosol generator, and an exit opening;  
4                   opening the ampoule to permit liquid from the ampoule to drain into a liquid  
5 receiving region of the feed system; and  
6                   operating the aerosol generator to eject liquid droplets through the exit  
7 opening.

1                   38.     A method as in claim 37, further comprising removing a bottom tab  
2 from the ampoule to form drain opening before inserting the ampoule into the aerosolization  
3 device.

1                   39.     A method as in claim 37, wherein the ampoule is held within a receiver  
2 unit of the liquid feed system, and further comprising inserting the receiver unit into the  
3 aerosolization device and coupling the receiver unit with the liquid receiving region.

1                   40.     A method as in claim 39, further comprising removing the receiver unit  
2 from the aerosolization device following operation of the aerosol generator and discarding the  
3 receiver unit.

1           41.     A method as in claim 40, further comprising cleaning the aerosol  
2 generator following removal of the receiver unit.

1           42.     A method as in claim 37, further comprising removing a top tab from  
2 the ampoule to form a vent opening after inserting the ampoule into the aerosolization device.

1           43.     A method as in claim 37, wherein the feed system includes an  
2 overflow region adjacent to the ampoule and further comprising permitting excess liquid to  
3 flow into the overflow region.

1           44.     A method as in claim 37, further comprising vibrating an aperture plate  
2 of the aerosol generator to produce the liquid droplets.

1           45.     A method for aerosolizing a liquid, the method comprising:  
2           inserting a receiver unit of a liquid feed system unit into an aerosolization  
3 device having an aerosol generator, wherein the receiver unit includes an ampoule containing  
4 a liquid, and wherein the receiver unit is inserted until coupled to a liquid receiving region of  
5 the feed system that is interfaced with the aerosol generator;  
6           opening the ampoule to permit liquid from the ampoule to drain into the liquid  
7 receiving region; and  
8           operating the aerosol generator to eject liquid droplets from the aerosolization  
9 device.

1           46.     A method as in claim 45, further comprising removing a bottom tab  
2 from the ampoule to form drain opening before inserting the receiver unit into the  
3 aerosolization device.

1           47.     A method as in claim 45, further comprising removing a top tab from  
2 the ampoule to form a vent opening after inserting the receiver unit into the aerosolization  
3 device.

1           48.     A method as in claim 45, wherein the receiver unit includes an  
2 overflow region adjacent to the ampoule and further comprising permitting excess liquid to  
3 flow into the overflow region.

1                    49.     A method as in claim 45, further comprising vibrating an aperture plate  
2     of the aerosol generator to produce the liquid droplets.